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PENSOFT

New records of *Synophis lasallei* (Nicéforo-María, 1950) and *Synophis niceforomariae* Pyron, Arteaga, Echevarría & Torres-Carvajal, 2016 (Serpentes, Colubridae) from the Cordillera Central in Colombia

Tatiana Toro Sanchez[1], Alejandro Montañez[2], Manuel Hernando Bernal[1]

1 Grupo de Herpetología, Eco-Fisiología & Etología, Departamento de Biología, Universidad del Tolima, 730006299, Ibagué, Colombia. **2** Independent researcher, Post Box 110831, Bogotá, Colombia.

Corresponding author: Manuel Hernando Bernal, mhbernal@ut.edu.co

Abstract

We report the presence of *Synophis lasallei* (Nicéforo-María, 1950) in the department of Tolima, Colombia, which represents the first record of this species in the Central Cordillera. In addition, we report a range extension for *Synophis niceforomariae* Pyron, Arteaga, Echevarría & Torres-Carvajal, 2016 to the departments of Caldas and Tolima; our new records of this species represent the southernmost documented localities in Colombia.

Keywords

Distribution, diversity, snakes, taxonomy.

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Introduction

The genus *Synophis* Peracca, 1896 comprises nine nominal species that primarily inhabit the Andean forests of Colombia, Ecuador, and Peru. The species in Colombia are *S. lasallei* (Nicéforo-María, 1950), *S. niceforomariae* Pyron, Arteaga, Echevarría & Torres-Carvajal, 2016, and *S. plectovertebralis* Sheil & Grant, 2001; in Ecuador are *S. bicolor* Peracca, 1896, *S. bogerti* Torres-Carvajal, Echevarría, Venegas, Chávez & Camper, 2015, *S. lasallei*, *S. zamora* Torres-Carvajal, Echevarría, Venegas, Chávez & Camper, 2015, and *S. zaheri* Pyron, Guayasamin, Peñafiel, Bustamante & Arteaga, 2015; and in Peru is *S. insulomontanus* Torres-Carvajal, Echevarría, Venegas, Chávez & Camper, 2015 (Pyron et al. 2016). Most of these species are extremely rare and little studied, presumably owing to the low densities of their populations and/or semifossorial habitats (Sheil and Grant 2001; Pyron et al. 2016).

In Colombia, *S. lasallei* is only known from three localities (Fig. 1) along the Cordillera Oriental: 1) the type locality in the municipality of Alban, department of Cundinamarca (04°53′N, 074°27′W; elev. 2,200 m); 2) in Villavicencio, department of Meta, on the eastern flank of Cordillera Oriental (04°09′N, 073°38′W; elev. 539 m); and 3) the Pico Renjifo, Serranía de la Macarena, department of Meta (02°28′37″N, 073°47′41″W; elev. 520 m) (Nicéforo-María 1950; Pérez-Santos and Moreno 1988; Pyron et al. 2016). On the other hand, *S. niceforomariae*

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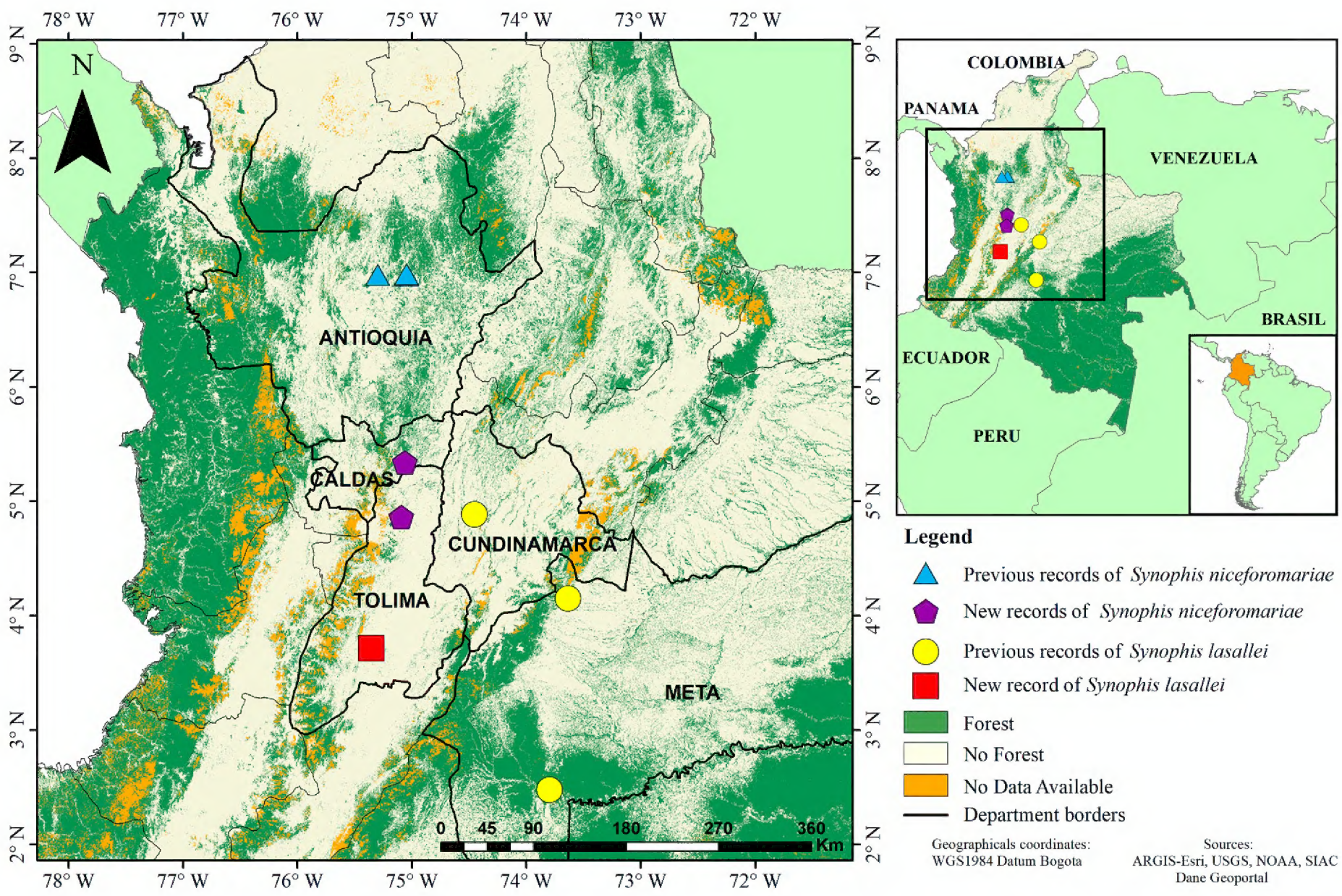

Figure 1. Geographic distribution of *Synophis lasallei* and *S. niceforomariae*. Yellow and blue colors indicate locations previously reported by Pyron et al. (2016). Red square: new record of *S. lasallei* in the Tolima department, Colombia. Purple pentagons: new records of *S. niceforomariae* in the Caldas and Tolima departments, Colombia.

(Pyron et al. 2016) is known from three localities in the department of Antioquia: the municipalities of Amalfi (06°58′43″N, 075°02′39″W; elev. 1,394 m), Anori (06°59′ 16″N, 075°02′39″W; elev. 1,320 m), and Campamento (06°58′46″N, 075°17′47″W; elev. 1,656 m). Herein, we report a new locality in the department of Tolima for *S. lasallei,* and two new localities for *S. niceforomariae* in the departments of Tolima and Caldas, all in the Cordillera Central of Colombia.

Methods

Fieldwork was carried out in rural areas of the municipalities of Chaparral and Líbano, department of Tolima, and the municipality of Pensilvania, department of Caldas, Colombia. The snakes were found during visual encounter surveys (VES), then euthanized using 2% xylocaine, fixed in 10% formalin, and preserved in 70% ethanol. The specimens were deposited at the Colección Zoológica Universidad del Tolima-Reptiles (CZUT-R) of the Universidad del Tolima. Identification was based on the taxonomic keys and descriptions of Nicéforo-María (1950), Pérez-Santos and Moreno (1988), and Pyron et al. (2016). Additionally, the snake specialist J.D. Lynch (Universidad Nacional de Colombia) confirmed the identity of these specimens. For the description of morphological characters, we adopted the format and terminology of Savage (2002).

Results

Synophis lasallei (Nicéforo-María, 1950)

Figure 2

New record. Colombia: department of Tolima: municipality of Chaparral, vereda La Virginia (03°42′53″ N, 075°21′12″W; elev. 1,437 m), collected by Tatiana Toro on 17 Sept. 2016 (1 spec., CZUT-R 0450; Fig. 2).

The individual was collected while active at night (19:43 hours, temperature 22.3 °C, relative humidity 64%) in moist leaf litter, approximately 5 m from the stream La Virginia, in a gallery forest.

Identification. A small snake, SVL 140.8 mm, tail length 84.1 mm, with a slender body and head distinct from neck. The snake presented the scutellational characters and typical coloration as mentioned by Nicéforo-María (1950) and Pérez-Santos and Moreno (1988), thus: 146 ventrals, 3 preventrals, 132 subcaudals, 20-20-19 dorsal scale rows with pronounced single keels, fused prefrontals, internasals in contact medially, loreal present, 2-2 postoculars, 1-1 preocular, 10 infralabials, 8 (4–5) supralabials, 3 (1+2) temporal scales, and single anal plate. The dorsal and lateral coloration was iridescent dark gray in life and preservation, with the labials and ventrals cream-colored, the ventrals becoming pigmented posteriorly with grey, the anal plate cream-colored, and the subcaudals dark grey as were the dorsals.

Figure 2. *Synophis lasallei* collected in Chaparral, Tolima (CZUT-R 0450). Photographed by Tatiana Toro.

***Synophis niceforomariae* Pyron, Arteaga, Echevarría & Torres-Carvajal, 2016**
Figure 3A, B

New records. Colombia: department of Caldas: municipality of Pensilvania, corregimiento Bolivia, stream La Soledad (05°20′ 27″N, 075°03′33″W; elev. 1,457 m), collected by Tatiana Toro and Alejandro Montañez on 20 Jan. 2018 (1 spec., CZUT-R 0490; Fig. 3A) • department of Tolima: municipality of Líbano, corregimiento Pradera Alta, stream Cerro Bravo (04°51′52″N, 075°05′24″W; elev. 1,575 m), collected by Alejandro Montañez, on 28 June 2015 (1 spec., CZUT-R 0506; Fig. 3B).

The snake collected in the department of Caldas was perched and active at night (20:00 hours) on the branch of a tree approximately 2 m above the stream La Soledad in a gallery forest. The other specimen, from the department of Tolima, was collected while perched and active at night (22:30 hours) on the branch of a tree approximately 50 cm above the stream Cerro Bravo in a gallery forest.

Identification. The snake from the department of Caldas (CZUT-R 0490; Fig. 3A) has a SVL of 432.7 mm, tail length of 240 mm, a slender body, and a head distinct from the neck. The snake presents the following scutellational characters: 186 ventrals, 3 preventrals, 132 subcaudals, 19-19-17 dorsal scale rows with single weak keels and smooth nuchal scales, fused prefrontals, internasals in contact, loreal present, 2-2 postoculars, 1-1 preocular, 10 infralabials, 9 (5-6) supralabials, 3 (1+2) temporal scales, single anal plate. The other specimen, from Tolima (CZUT-R 0506; Fig. 3B), is probably a juvenile or subadult snake: SVL 166.76 mm, tail length 81.97 mm, with the following scutellational characters: 195 ventrals, 3 preventrals, 136 subcaudals, 19-19-17 dorsal scale rows with single weak keels and smooth nuchal scales, fused prefrontals, internasals in contact, loreal present, 2-2 postoculars, 1-1 preocular,

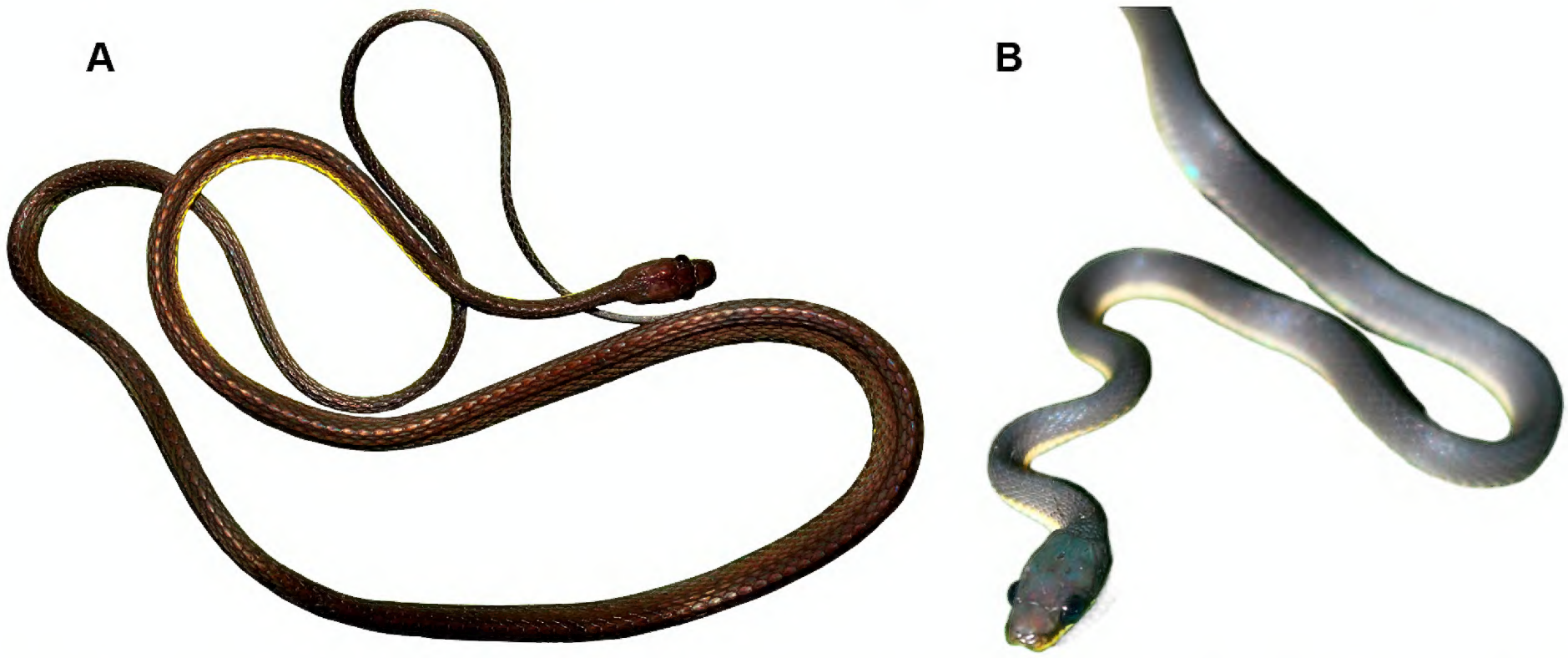

Figure 3. *Synophis niceforomariae*. **A.** From Pensilvania, Caldas (CZUT-R 0490). **B.** From Líbano, Tolima (CZUT-R 0506). Photographed by Alejandro Montañez.

10 infralabials, 9 (5-6) supralabials, 3 (1+2) temporal scales, single anal plate.

Besides having their scutellation characters within the ranges reported for *S. niceforomariae*, these snakes presented the typical coloration as mentioned by Pyron et al. (2016). The dorsal and lateral surfaces were iridescent gray dark in life and preservation, the labials and the first third of the ventrals were cream-yellow, the posterior two-thirds to the vent were cream with dark mottling, and the subcaudals were dark grey as were the dorsals.

Discussion

Although the study of the cryptic species of the genus *Synophis* has increased in the last years, culminating with the description of new species (Pyron et al. 2015, 2016; Torres-Carvajal et al. 2015), there is still confusion over the boundaries between species and taxonomic identification. This confusion results in uncertainty regarding the geographic distributions and diagnostic characters for these species (Pyron et al. 2016). In Colombia, currently three endemic species are known—*S. lasallei, S. niceforomariae*, and *S. plectovertebralis*—which share many similar morphological characteristics but also are differentiable by scutellation and coloration. For instance, *S. plectovertebralis* differs from *S. lasallei* and *S. niceforomariae* in presenting between 144 and 147 ventral scales, 79 and 91 subcaudals, and seven or eight infralabials and supralabials, whereas *S. lasallei* and *S. niceforomariae* have more ventral scales (*S. lasallei:* 144–174; *S. niceforomariae:* 184–193), more subcaudals (*S. lasallei:* 101–126; *S. niceforomariae*: 127–131), and more than eight infralabials or supralabials. *Synophis lasallei* differs from *S. niceforomariae* in having notably fewer ventral scales (in our specimens: 146 for *S. lasallei,* 186 and 195 for the two specimens of *S. niceforomariae*). They also have clear differences in their ventral coloration, particularly on the posterior two-thirds of the venter, which is increasingly with cream and dark in *S. niceforomariae*, whereas only weakly mottled or almost similar to the anterior third in *S. lasallei*.

The new record of *S. lasallei* extends the geographical distribution of this species 172 km southwest in a straight line from its nearest previous locality at Alban (Cundinamarca). The new record represents the westernmost record for the species and the first record from the Cordillera Central in Colombia, where *S. lasallei* has only ever been recorded in the Cordillera Oriental (Fig. 1). For *S. niceforomariae*, the new reports from Pensilvania (Caldas) and Líbano (Tolima) extend the geographical distribution 183 km and 234 km south in a straight line, respectively, from the nearest previously reported locality in Amalfi (Antioquia). The municipality of Líbano (Tolima) now constitutes the southernmost known locality for this species (Fig. 1).

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Authors' Contributions

TT and AM collected the specimens in the field; TT, AM, and MHB examined the specimens; TT and AM prepared the map; TT and AM photographed the individuals; TT, AM, and MHB wrote the text.

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